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# PATENT SPECIFICATION

DRAWINGS ATTACHED

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## COMPLETE SPECIFICATION

### Improvements in or relating to Discharge Pipes for Hot Water Supplies

5 We, LICENTIA PATENT-VERWALTUNGS G.M.B.H., a German Company having its registered office at Frankfurt (Main) Theodor-Stern-Kai 1, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to improvements in discharge pipes for hot water supplies, for example to a discharge pipe for a domestic water heater, which pipe is swivel-mounted and does not include any stop valve.

15 For the supply of domestic hot water, gas fired and electrically heated water heaters are often provided where no central water heating boiler is available, such water heaters terminating in a swivel-mounted pipe, which does not include any stop valve, and is so  
20 arranged that the pipe may be swivelled between alternative positions in which it discharges hot water respectively into a wash-hand basin and into a bath. A handle may be provided on the pipe to reduce the risk of a  
25 user being burned, and usually the discharge end of the pipe will be provided with some form of anti-splash device, fitting inside the pipe.

30 As a result of the provision of the internal anti-splash device, after the completion of the operation of tapping-off hot water, which is usually effected by control of a stop valve in the water supply to the heater, which discharges on the overflow principle, a quantity  
35 of hot water remains in the discharge pipe. This water may drain away after a short interval, after some air has leaked upwardly into the pipe through the anti-splash device, but if a discharge of cold water is required  
40 from the pipe shortly after hot water has been withdrawn, the hot water stored in the pipe is discharged first and there is a risk, when cold water is expected, that the user will be scalded by this initial discharge.

According to the present invention, a discharge pipe for a hot water supply, comprises a pipe having an outlet through which, in use, water is discharged substantially downwardly, an anti-splash device fitted to the outlet end of the pipe, and a vacuum breaking bore extending upwardly through the wall of an upper part of the pipe, whereby air can bleed  
50 downwardly through that bore into the pipe to break any vacuum therein caused by the anti-splash device temporarily preventing inflow of air upwardly through the outlet and thus permit rapid and complete or substantially complete draining of water from the pipe outlet.

The invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a side elevation of the water discharge pipe of a domestic water heater;

65 Figure 2 is a sectional side elevation of an alternative construction of the right-hand end of the pipe shown in Figure 1; and

70 Figure 3 is a sectional side elevation, similar to Figure 2 but showing a third alternative construction.

Referring first to Figure 1, a discharge pipe 1 of a water heater includes two substantially vertical end parts, directed respectively upwardly and downwardly from a horizontal central part. The upwardly directed end part is connected to an outlet nozzle of the water heater by a nut 2 which supports the pipe in a fluid-tight manner but permits swivelling of the pipe about the axis of this vertical end part of the pipe. The downwardly directed end of the pipe 1 has fitted into it an anti-splash device 3 which serves for subdividing the water flow and intimately mixing the water with air. Mounted on the curved part of the pipe, which joins the downwardly directed outlet end part to the central horizontal part, is a thermally insulating handle 4 made of a synthetic plastics material. Handle

[Price 4s. 6d.]

4 is circular in cross-section and increases progressively in diameter towards its upper end. A bore 5 extends axially through handle 4, and through the subjacent wall of the pipe 1, the diameter of bore 5 being small enough to present a considerable resistance to water flow but large enough to permit a vacuum breaking leakage of air inwardly into the pipe 1.

In use of the water heater, a water control valve arranged in the supply pipe leading to the heater is used to cause a flow of water through the pipe by a spill-over process. Hot water is discharged through the pipe 1, but there is little if any tendency for water to rise through the bore 5. When the flow of cold water into the heater is discontinued, air can bleed in through the bore 5 and prevent the formation of a partial vacuum inside the pipe 1, so that the pipe 1 rapidly drains free of hot water. Thus, once the flow of hot water has ceased, the user is certain that no hot water is trapped in the pipe 1.

Although the flow of water through the pipe 1 should never be controlled by blockage of the outlet therefrom, or of a hose connected thereto, should the flow of water be stopped in that manner there will be a tendency for water to be discharged upwardly through the bore 5 and out of the top of the handle. The constructions shown in Figures 2 and 3 are adapted to prevent such a discharge.

Referring now to Figure 2, the handle 4 is mounted on a small tube 6 which is mounted on and extends through the wall of pipe 1. A ball valve 8 is trapped inside the handle 4 above the tube 6, and is adapted to permit downward flow of air through the bore 5 but, upon the upward flow of water, to block the lower end of the bore 5.

Referring now to Figure 3, the handle 4 is mounted on a small tube 6 which is mounted on and extends through the wall of pipe 1. The handle 4 is provided with a blind axial hole 9 which, in the part of the handle above the tube 6, is reduced to a much smaller diameter than the part of the hole nearer the pipe 1. The depth of the bore 9 is so selected that, with the handle 4 mounted on the tube 6, a space exists between the lower end of the handle and the pipe. The diameter of the bore 9 is so chosen in relation to the diameter of the tube 6 that, between the external surface of the tube 6 and the inner surface of the handle, an air blow channel 10 is formed. The free end of the tube 6 is axially forked and fits within the upper end of the bore 9. There is thus an air flow channel 10 through which air can flow into the pipe 1.

#### WHAT WE CLAIM IS:—

1. A discharge pipe for a hot water supply, comprising a pipe having an outlet through which, in use, water is discharged substantially downwardly, an anti-splash device fitted to the outlet end of the pipe, and a vacuum breaking bore extending through the wall of an upper part of the pipe, whereby air can bleed through that bore into the pipe to break any vacuum in the pipe caused by the anti-splash device temporarily preventing inflow of air upwardly through the outlet and thus permit the rapid and complete draining of the pipe.

2. A discharge pipe as claimed in Claim 1, wherein the outlet is in a substantially vertical portion of the pipe and the vacuum breaking bore extends upwardly through an upper portion of the wall of a substantially horizontal upper part of the pipe.

3. A discharge pipe as claimed in Claim 2, wherein the pipe is provided with swivel mounting by which the pipe outlet end can be moved, a heat insulating handle is provided on the pipe to facilitate movement of the outlet end, and the bore is continued into the handle.

4. A discharge pipe as claimed in Claim 3, wherein the bore extends axially of, and terminates at the upper end of, the handle.

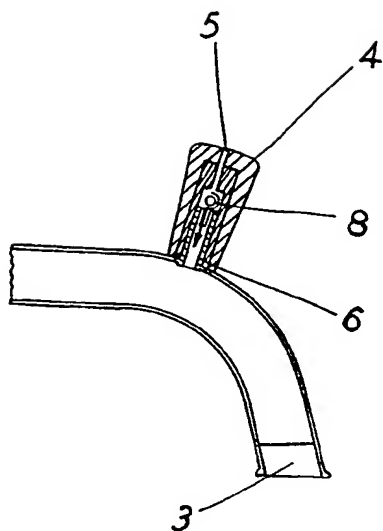
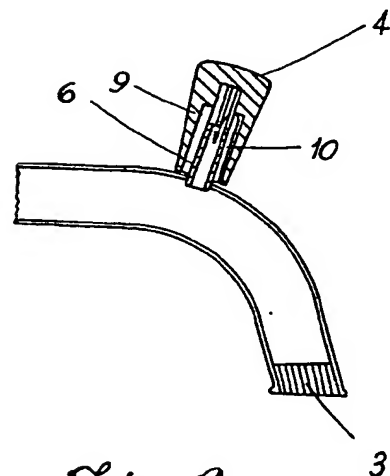
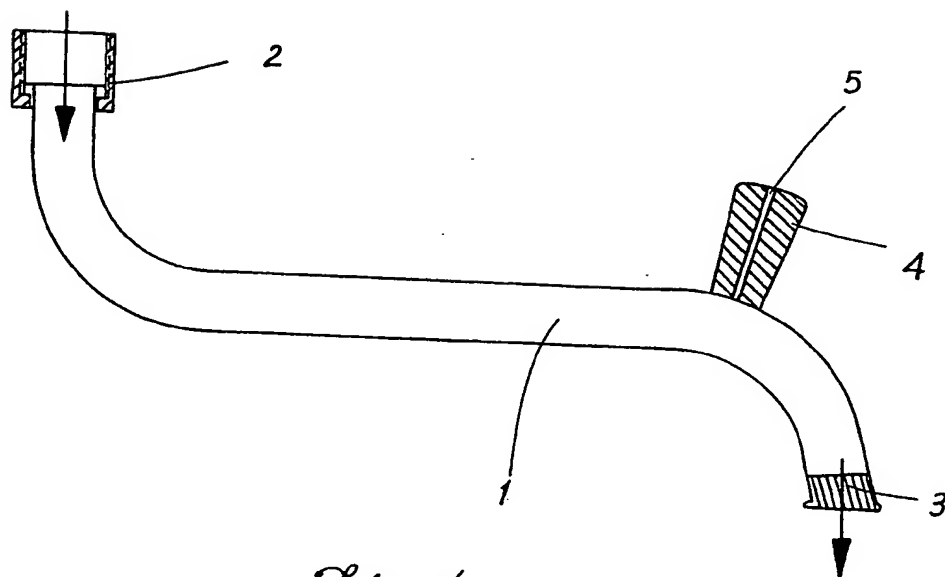
5. A discharge pipe as claimed in Claim 3, wherein the bore is arranged to terminate adjacent the pipe, in such a manner that any discharge of water therethrough from the pipe will be directed away from the gripping surface of the handle.

6. A discharge pipe as claimed in Claim 5, wherein the handle is mounted on a tube itself mounted on the pipe, the vacuum breaking bore includes a part extending axially of the tube, the handle is mounted on an upper part of the tube, and the lower end of the handle is spaced from the pipe to provide an annular water discharge space.

7. A discharge pipe as claimed in any of Claims 3 to 6, wherein the bore includes a ball valve adapted to permit the inflow of air but to preclude the outflow of water.

8. A discharge pipe for a hot water supply, substantially as shown in, and adapted to operate substantially as hereinbefore described with reference to, Figure 1, Figure 2 or Figure 3 of the accompanying drawings.

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*Fig. 2.**Fig. 3**Fig. 1.*

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